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Original article

THE CORRELATION BETWEEN ISCHEMIC STROKE, ATRIAL FIBRILLATION AND EARLY NEUROREHABILITATION

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Abstract

Objective. Atrial fibrillation is the most common cause of ischemic strokes. The inadequate therapy of this heart arrhythmia can lead to brain damages associated with paralysis and various other symptoms depending on the affected territory. The early kinetotherapy and the appropriate treatment play the major role in the recovery of these patients.

Methods. Between January 2013 – November 2014 we hospitalized on emergency 186 patients with acute ischemic stroke caused by deficient treatment of the atrial fibrillation. The demographic data, clinical, imagistic (cerebral-CT, cerebral-MRI, extracranial ultrasound, minimum two ECGs, Echocardiography), paraclinicdata, as well as risk factors (hypertension, diabetes mellitus, valvulopathies, carotid stenosis, diffuse carotid atheromatosis, dyslipidemia, obesity, chronic renal insufficiency, polyglobulie, cancer), treatment, kinetotherapy were all considered.

Results. We studied 186 patients, 127 females and 59 males (68,28 % versus 31,72 %). Most of the patients are with permanent atrial fibrillation (172 cases, 92,47 %). The biggest number of our cases were treated with antiplatelet therapy for atrial fibrillation (88 cases, 47, 31 %), followed by anticoagulant therapy (77 cases, 41,4 %), antiplatelet + anticoagulant therapy (14 cases, 7,53 %), dual antiplatelet therapy (5 cases, 2,69 %), dual antiplatelet + anticoagulant therapy (2 cases, 1,07 %). According to the age group, the highest frequency of ischemic stroke is between 70-79 years old (78 cases, 41,94 %). More than 50 % had an inappropriate international normalized ratio. Valves insufficiency were diagnosed at 66 cases, 35, 48 %, as well as prosthetic heart valves and dilated cardiomyopathy (21 cases, 11,29 %), atrial trombi (5 cases, 2,68 %), hypertension (167 cases, 89,78 %), diabetes mellitus (46 cases, 24,73 %), carotid stenosis (6 cases, 3,22 %), diffuse carotid atheromatosis (17 cases, 9,13 %), dyslipidemia (39 cases, 20,96 %), obesity (13 cases, 6,98 %), polyglobulie (21 cases, 11,29 %), chronic renal insufficiency (40 cases, 21,5 %), cancer (8 cases, 4,3 %). We have taken into consideration also the dimension of the affected cerebral territory, as well as the muscular deficiency caused by it (123 cases, 66,13% with large territory affected and total muscular deficiency and 63 cases, 33,87% with small territory affected and partial muscular deficiency or not at all). After 14 days of kinetotherapy and appropriate treatment, 112 cases, 60,21 % had a favorable recovery, 50 cases, 26,88 % remained stationary and 24 cases, 12,90 % died.

Conclusions. Incorrectly treated atrial fibrillation causes lots of ischemic strokes nowadays, especially in women between 70-79 years old, associated with various risk factors. Strokes lead to depression and social disability, there's why kinetotherapy initiated in 48 hours after the stroke onset and continued till 6 months has an important role in the rehabilitation of the muscular deficiencies and quality of life.

Key Words: Kinetotherapy, stroke, atrial fibrillation, antiplatelet/ anticoagulant therapy.

Introduction

Atrial fibrillation is a very commonly heart arrhythmia which can be paroxysmal, persistent or permanent. Can be diagnosed at normal patients especially after stress, surgical interventions, effort or alcoholic intoxication. Also hypoxia, hypercapnia or metabolic and hemodynamic disturbances can lead to this arrhythmia. Permanent atrial fibrillation can be produced by various cardiopathies (reumatismal, nonreumatismalvalvulars, hypertensive, BPCO), tyreotoxicity (Avram et al, 2006).

It is well known that patients with atrial fibrillation have of a higher risk of thromboembolism causing especially strokes with a high impact in the quality of life. Patients with paroxysmal atrial fibrillation experience a similar risk of thromboembolism compared to patients with persistent atrial fibrillation. Therefore, consensus guidelines

recommend anticoagulant therapy in those at risk for thromboembolism irrespective of atrial fibrillation classification (Hsu et al, 2014).

Not all patients with atrial fibrillation can receive anticoagulant therapy because of the associated pathologies or high risk of bleeding. There is why they are treated only with antiplatelet therapy. The purpose of our study was to compare the prevalence of acute strokes caused by atrial fibrillation depending on the antiplatelet/anticoagulant therapy.

Acute strokes represents one of the main causes of mortality and morbidity in the world. The most common substrate for cerebral embolism in older patients is atrial fibrillation. There are also a lot of risk factors such as hypertension, diabetes mellitus, valvulopathies, carotid stenosis, diffuse carotid atheromatosis, dyslipidemia, obesity, chronic renal insufficiency, polyglobulie, cancer which, associated

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with atrial fibrillation, raise the changes to develop an acute stroke.

The concept “time means brain” refers to the fact that the treatment of the acute stroke is an emergency (Bajenaru 2012).

The second important role in the recovery of the patients with paralysis plays the early kinetotherapy. It should be initiated in 48 hours after the stroke onset and continued till six months because the most rapid recovery takes place in the first few weeks and then the largest amount of recovery occurred within the first three to six months.

Material and methods

Patients:

Between January 2013 – November 2014 we hospitalized on emergency 186 patients with acute ischemic stroke caused by deficient treatment of the atrial fibrillation. The demographic data, clinical, imagistic (cerebral-CT, cerebral-MRI, extracranial ultrasound, minimum two ECGs, Echocardiography), paraclinical data, as well as risk factors (hypertension, diabetes mellitus, valvulopathies, carotid stenosis, diffuse carotid atheromatosis, dyslipidemia, obesity, chronic renal insufficiency, polyglobulie, cancer), treatment, kinetotherapy were all considered.

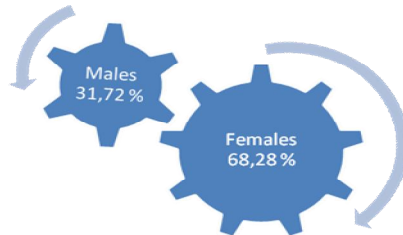
Investigations:

- Electrocardiogram (ECG): for each patient we have made a first ECG in the Emergency Unit and another one later. All of them had atrial fibrillation at admission.
- Native Computer Tomography (CT) made in the emergency showed us either the exactly lesions or only indirect signs, but we could exclude hemorrhages.
- Carotid ultrasound was used to diagnose carotid stenosis and diffuse carotid atheromatosis
- Echocardiography was used to diagnose various valvulopathies, prosthetic heart valves, cardiomyopathy, atrial thrombi
- Cerebral MRI was useful for us to discover the exact lesions or to monitor the lesions already showed in the cerebral CT
- Blood pressure measurement
- Blood tests: CBC, glycaemia, total cholesterol, creatinine

Results

We studied 186 patients, 127 females and 59 males (68,28 % versus 31,72 %). (Fig.1.)

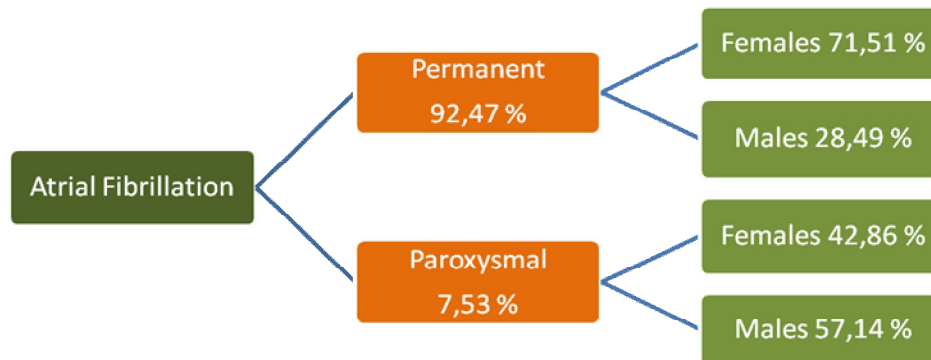
Fig.1. Distribution of cases according to sex



Most of the patients are with permanent atrial fibrillation (172 cases, 92,47 %), 123 females, 71,51 % and 49 males, 28,49 % and only 14 cases, 7,53 % are

with paroxysmal atrial fibrillation, 6 females, 42,86 % and 8 males, 57,14 % . (Fig.2.)

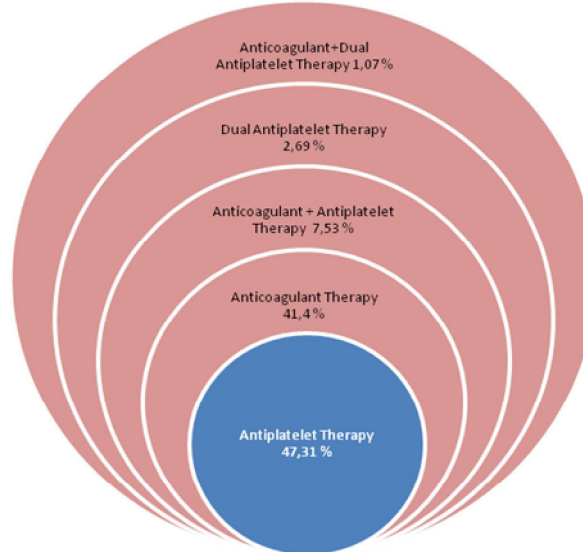
Fig.2. Distribution of the cases according to atrial fibrillation type



The biggest number of our cases were treated with antiplatelet therapy for atrial fibrillation (88 cases, 47, 31 %), followed by anticoagulant therapy (77 cases, 41,4 %), antiplatelet + anticoagulant therapy (14 cases,

7,53 %), dual antiplatelet therapy (5 cases, 2,69 %), dual antiplatelet + anticoagulant therapy (2 cases, 1,07 %). (Fig.3.)

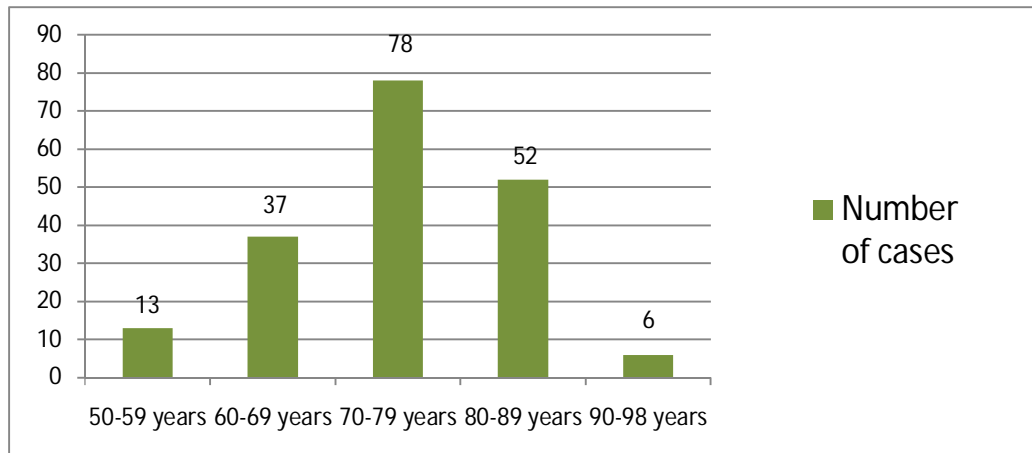
Fig.3. Distribution of the cases according to antiplatelet/anticoagulant therapy



According to the age group, the highest frequency of ischemic stroke is between 70-79 years old (78 cases, 41,94 %), followed by 80-89 years old

(52 cases, 27,96 %), 60-69 years old (37 cases, 19,89 %), 50-59 years old (13 cases, 6,99 %) and 90-99 years old (6 cases, 3,22 %). (Fig.4.)

Fig.4. Distribution of the cases according to age groups



More than 50 % had an inappropriate international normalized ratio. More exactly 48 patients from 83 with dicumarinic treatment (57,83%), 28 females versus 58,33 % and 20 males versus 41,66 %.

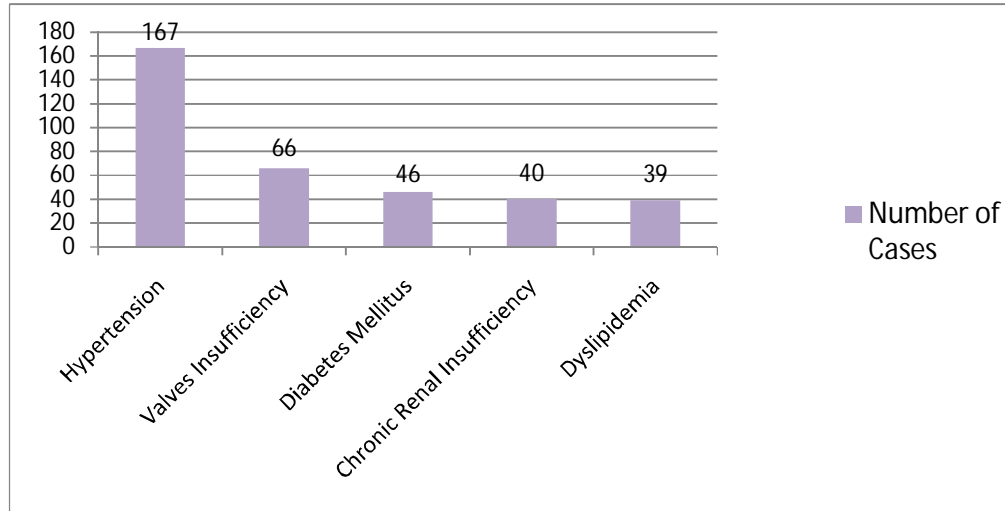
Valves insufficiency were diagnosed at 66 cases, 35, 48 %, (40 females versus 60,60 % and 26 males versus 39,39 %), as well as prosthetic heart valves and dilated cardiomyopathy (21 cases, 11,29 % ; 13 females versus 61,9 % and 8 males versus 38,1 %), atrial trombi (5 cases, 2,68 %; 4 females versus 80 %

and 1 male versus 20 %), carotid stenosis (6 cases, 3,22 %; 2 females versus 33,33 % and 4 males versus 66,67 %), diffuse carotid atheromatosis (17 cases, 9,13 %; 13 females versus 76,47 % and 4 males versus 23,53 %), obesity (13 cases, 6,98 %; 9 females versus 69,23 % and 4 males versus 30,77 %), polyglobulie (21 cases, 11,29 %; 19 females versus 90,48 % and 2 males versus 9,52 %), cancer (8 cases, 4,3 %; 5 females versus 62,5 % and 3 males versus 37,5 %).

But 167 cases, 89,78 % had also **hypertension** (117 females versus 70,06 % and 50 males versus 29,94 %) and 46 cases, 24,73 % **diabetes mellitus** (29 females versus 63,04 % and 17 males versus 36,96 %),

chronic renal insufficiency (40 cases, 21,5 %; 24 females versus 60 % and 16 males versus 40 %), **dyslipidemia** (39 cases, 20,96 %; 29 females versus 74,36 % and 10 males versus 25,64 %). (Fig.5.)

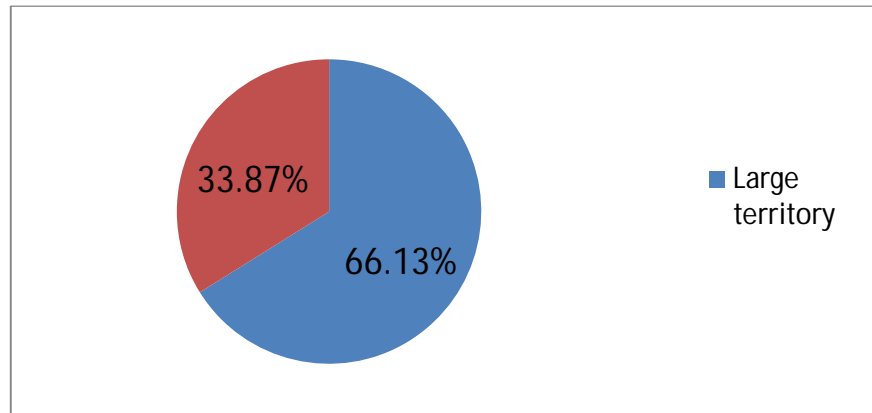
Fig.5. Distribution of the cases according to risk factors



We have taken into consideration also the dimension of the affected cerebral territory, as well as the muscular deficiency caused by it :123 cases, 66,13% (90 females versus 73,17 % and 33 males versus 26,83 %) with large territory affected and total

muscular deficiency and 63 cases, 33,87% (37 females versus 58,73 % and 26 males versus 41,27 %) with small territory affected and partial muscular deficiency or not at all). (Fig.6.)

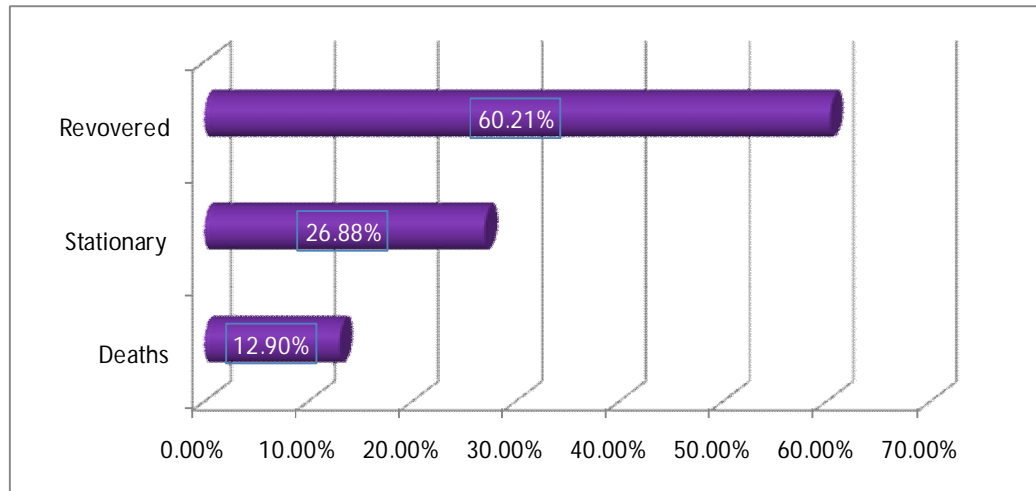
Fig.6. Distribution of the cases according to dimension of the territory affected



After 14 days of kinetotherapy and appropriate treatment 112 cases, 60,21 % had a favorable recovery,

50 cases, 26,88 % remained stationary and 24 cases, 12,90 % died.

Fig.7. Distribution of the cases according to prognostic



Kinetohterapy

Neurorehabilitation is a complex medical process whose purpose is to minimize or to compensate alterations resulting from a brain injury. In the neurorehabilitation process is not only the kinetotherapist implied, but also the family of the patient. A particular focus is given to improving mobility and strength, as this is the key to a person's independence.

Rehabilitation of stroke patients, is a complex chain of consistently conducted medical and social measures aimed at rehabilitation, health or possible adaptation to self-service in the presence of a persistent neurological defect. Already in acute stroke patient needs not only to drug therapy and care, but also in the emotional and psychological support for the type of "cautious optimism." It should be explained to the patient a temporary, reversible nature of its existing motor. With relatives patient should discuss the real situation, prognosis, rehabilitation opportunities, the need for hospitalization or appropriate treatment at home, put them in front of clear objectives for the near future (Murashko, 2012).

Impaired motor function after stroke is a major cause of disability in young stroke survivors. The plasticity of the adult human brain provides opportunities to enhance traditional rehabilitation programs for these individuals. Younger stroke patients appear to have a greater ability to recover from stroke and are likely to benefit substantially from treatments that facilitate plasticity-mediated recovery (Stein, 2004).

Approximately one-third of patients with stroke exhibit persistent disability after the initial cerebrovascular episode, with motor impairments accounting for most poststroke disability. Exercise and training have long been used to restore motor function after stroke. Better training strategies and therapies to enhance the effects of these rehabilitative protocols are

currently being developed for poststroke disability (Dimyan, Cohen, 2011)

Discussions

Atrial fibrillation is a devastating heart arrhythmia, which incorrectly treated, and associated with other risk factors can produce serious brain damages. The consequences of these damages are decreasing significant the quality of life of the affected patients because they can lead to serious disabilities and loss of independence.

To avoid these catastrophes, the scientists are trying to discover the best treatment for this arrhythmia. Although a substantial proportion of patients with atrial fibrillation who have an ischemic stroke are already receiving oral anticoagulation. Sub-optimal levels of anticoagulation and additional etiologies explain, only in part, this failure. Further research is needed to help find adequate therapeutic strategies in atrial fibrillation patients who sustain an ischemic stroke while receiving oral anticoagulation.

The recovery of the stroke patients depends on a number of factors. Firstly the adequate medical treatment, secondly the kinetohterapy and finally the optimism of the patients. Also a lot of risk factors should be taken into consideration.

Kinetohterapy should be done by a kinetoterapist during the hospitalization and then by the family. He should teach the patient's family all the techniques needed to work with each segment of the body and then with the whole body.

Definitely detecting this heart arrhythmia is crucial for each patient and the correct treatment is essential to avoid a ischemic stroke. Otherwise, the consequences are devastating and a big team of medical personal must work together for the neurorehabilitation of these patients.



Conclusions

Incorrectly treated atrial fibrillation causes lots of ischemic strokes nowadays, especially in women between 70-79 years old, associated with various risk factors.

The ischemic strokes lead to depression and social disability, there's why the correct treatment and kinetotherapy initiated in 48 hours after the stroke onset and continued till 6 months has an important role in the rehabilitation of these patients and in the quality of life.

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